Massachusetts Department of Environmental Protection

**Instructions for Completing the 2007 Public Water Supply Annual Statistical Report for Community (COM) systems using 100,000 gallons per day or more.**

The following are instructions for completing the MassDEP Public Water Supply Annual Statistical Report (ASR). These instructions and blank electronic versions of the ASR are available from MassDEP's website at http://www.mass.gov/dep/water/approvals/dwsforms.htm

## Section A Certification

Name of Certifying Person:

Generally this is the person responsible for the operation of the PWS and is responsible for completing the ASR. It may be a water department superintendent, chairperson of the water board, or the Primary Certified Operator. Provide name, title, phone number, and fax number. The certifying person is required to sign and date the form.

## Section B Public Water Supply Information

Review the Comprehensive Report that was enclosed with the copy of this ASR mailed to you to check for accuracy. If there are changes to the Comprehensive Report mark the changes and highlight them.

1. Provide the PWS mailing address, phone number and fax number (if available) for the legally responsible party. Provide the Web address of the PWS, if available.

2. Provide the name of the owner of the PWS, if the PWS is other than a municipal supply. For municipal supplies, leave blank (assumed to be the same as #1 above).

3. Provide the name, phone number and email address of the primary contact for the PWS.

4. Provide the names, grades, license numbers and status of the system operators.

5. Provide the name, phone number, E-mail address and mailing address of the system primary operator.

6. Self-explanatory.

7. If applicable, provide the names and phone numbers of the members of the governing body of the PWS. Attach additional sheets if necessary.

8. Provide the Federal Identification Number (FEIN).

9. Self-explanatory.

10. Population Served: Include the population served, whether or not a change has occurred. This is generally the residential population served by your PWS. Use the most recent census data available. Often, this is a local census available from town or city government. If population served was calculated using Method 1 or 2 of Section **G** (Residential Gallons per Capita Day) state so under "other method".

11. Distribution Meter Information:

    a. Percentage of distribution system metered: This is the percentage of the water system service connections that are metered. For example if there are 400 service connections and 20 do not have meters (municipal buildings, schools, etc.), then the system is 95% metered (380/400 x 100). If every service connection is metered, then the system is 100% metered.

b. Are all publicly owned buildings metered? Answer "yes" only if all public buildings (schools, police stations, fire stations, etc.) are metered.
c. If No, what percent are? Enter the percentage of service connections to public buildings (including schools) that are metered. If there are 20 service connections to public buildings, and 15 have meters, then 75% of public buildings are metered (15/20 x 100).

12. System Information

a. Number of Service Connections: This is the total number of connections to the distribution system through which water can be obtained (other than hydrants). It includes metered and unmetered connections, public and private connections, and year-round and seasonally used connections.

b. Finished Water Storage Capacity (MG): This is the total volume capacity of water tanks in your system, in millions of gallons.

Example: There are three tanks in your system, with capacities of 1,500,000 gallons, 2,000,000 gallons, and 750,000 gallons.

The total storage capacity = 1,500,000 + 2,000,000 + 750,000 = 4,250,000 gallons

4,250,000 gallons/1,000,000 = 4.25 MG

13. Emergency Response Actions:
a. Indicate that you have an Emergency Response Plan (ERP) for your system. Do not attach your ERP to the ASR. Your ERP will be reviewed during your next sanitary survey. Also indicate whether or not you have made changes to your ERP. If you did make changes, attach copies of the ERP changes to the ASR.

b. Indicate whether or not you have an Emergency Response (ER) annual training plan. If you do, attach a copy of the training plan and a description of the reporting year's training, including types of training, date(s) of training, and number of staff and local official trained and their titles.

c. Indicate whether or not your system is registered for the Health and Homeland Alert Network (HHAN).

d. Indicate whether or not your system has joined the Massachusetts Water and Wastewater Agency Response Network.

e. Indicate how often your system tests all alarms, interlocks and back-up power sources.

f. List all Level 3 or higher ER incidents during the reporting period.

14. Attach an updated Emergency Response Plan Directory to the ASR.

15. Do you have antennae or other appurtenance attached to your storage tank(s)?: Check either yes or no. Antennae or Appurtenance: may include cell phone transmitters and receivers, and/or police, fire or other municipal communication equipment that is attached to your storage tank(s).

## Section C Cross Connection Control Program (CCCP)

1. Provide the name, telephone number and address of your cross-connection control coordinator.
2. Provide the name, license number, phone number and address of the surveyor responsible for cross-connection design sheets and plans.
3. Indicate whether or not you have surveyed all commercial, industrial, institutional and municipal facilities in your service area for cross-connections. If yes, provide the date the survey was completed. If no, provide the date you expect the survey to be completed.
4. Check the appropriate boxes to indicate whether or not your system is protected by either Reduced Pressure Backflow Preventers (RPBPs) or by Double Check Valve Assemblies (DCVAs). If the answer is "yes" to either, proceed to question 5 (Table C1). If the answer to both is "No" then proceed to question No. 13.
5. **Table C1 Summary of Facilities Surveyed** For each type of facility (commercial, industrial, institutional, municipal) provide the number of facilities served by the PWS and the total number of facilities surveyed since the inception of your CCCP. To obtain "the number of facilities remaining to be surveyed", subtract facilities surveyed to date from the total number of facilities. In the last column, provide the number of facilities surveyed during 2007.
6. **Table C2 Summary of Installed Devices and Assemblies** Attach a list of ALL registered cross-connections that are being protected by an RPBP or DCVA. The list must contain at a minimum the following information: owner/business name, Cross Connection ID#, type of protection (RPBP or DCVA), brand, model, serial # and exact location within the facility.
7. **Table C3 Backflow Preventer Testing Program Summary** Summarize the number of initial tests, routine tests, failures, repairs and re-tests for both RPBPs and DCVAs performed in the reporting year.
8. Indicate the maximum amount of time you allow to protect a cross-connection once it is discovered.
9. Indicate whether or not you have fully implemented cross-connection education program for residential customers.
10. Indicate whether or not you have fully implemented cross-connection education program for industrial, commercial, institutional and municipal users. If yes, indicate which types of users are targeted by your education program.
11. Indicate whether or not you have an atmospheric vacuum breaker program for your customers. These are for protecting garden hose bib connections, usually on the sides of buildings. If you do not have a program, indicate if you plan on instituting one in the future.
12. Indicate if you have a local ordinance, bylaw or policy statement for cross-connection control.
13. Indicate whether or not your water system has a containment policy. A containment policy means that ALL service connections have a cross-connection control device at the meter to isolate each facility independently of its activity. To answer "Yes" ALL service connections in your system must have a device at the meter.
14. Indicate whether or not your system used the service of a contractor or consultant to implement all or part of your cross-connection control program. If "Yes", provide their names, MassDEP Certification IDs and Certification expiration dates.

15. Indicate if there was a cross-connection incident in your water system during the reporting year. If "Yes", provide the date, location, and description.

## Section D Water Production & Consumption Information

Under Federal Safe Drinking Water Act regulations, MassDEP is required to collect data on finished water volumes produced by public water suppliers. The Massachusetts Water Management Act requires that raw water volumes be metered and reported to MassDEP. Use Tables D1 and D2 to report finished and raw water volumes, respectively. All suppliers must report their finished water volumes in Table D1. Suppliers that have different finished and raw water volumes (as a result of treatment process losses) must report raw water volumes separately in Table D2. If finished water volumes are the same as raw water volumes (no treatment plant losses occur), indicate by checking the " ☒ Same as finished water" box above Table D2 and do not complete Table D2.

**Table D1 FINISHED Water Production and Consumption Summary for Last Year (2007):**
All PWSs will complete Table D1. The volumes of water listed in Table D1 are the finished water volumes pumped from your sources after treatment (if any) and/or purchased (if any) and/or sold to another system (if any). For groundwater sources where treatment is limited and does not result in a reduction in volume (e.g. adding chemicals for corrosion control or disinfection) the volume of raw water pumped from the wells will be the same as the finished water available to the system. If finished water volumes are the same as raw water volumes for your own water, purchased water, or sold water, then complete only Table D1.

Maximum Daily Finished Water Consumption: This is the highest one-day volume of finished water pumped in one day during the calendar year. Include the date on which this occurred.

**Table D2 RAW Water Production and Consumption Summary for Last Year (2007)**

For surface water systems and groundwater requiring further treatment, treatment plant losses will result in finished water volumes less than the raw water volumes. If raw water volumes are greater than finished water volumes, report raw water volumes in Table D2 and report treatment plant losses in Table D3.

The volumes of water listed in Table D2 are the raw water volumes pumped from your sources, purchased from other suppliers, and/or sold to other suppliers. If the raw water volumes are the same as the finished water volumes for your own sources, purchased water and sold water, then check " ☒ Same as finished water" and do not complete Table D2.

Maximum Daily Raw Water Consumption: This is the highest one-day volume of raw water pumped in one day during the calendar year. Include the date on which this occurred.

**Table D3 Summary of Treatment Plant Losses**

Account for treatment plant losses in Table D3. Subtract the finished water volume from the raw water volume to obtain the volume of treatment plant loss. If you have a different method of accounting for treatment plant losses, describe in the box below Table D3 and/or attach supporting documentation (calculations, records, etc.) to the ASR.

**Table D4 Summary of Water Purchased or Sold**

In Table D4 summarize water purchased from other systems or sold to other systems. Include the name(s), PWS ID(s) and volumes of water purchased or sold. Also indicate if the water purchased or sold was raw or finished.

**Table D5 Percentage of Source Types**

This is the percent of each source of raw water obtained for the system. Together the four types of source water must add to 100% of the total raw water.

**Table D5 Example 1:** All the system water comes from groundwater wells owned by your PWS

| Ground Water | Surface Water | Purchased Ground | Purchased Surface |
|---|---|---|---|
| 100% | % | % | % |

**Table D5 Example 2:** A total of 4 MGD of raw water is used by your system, 2 MGD from wells owned by your PWS, 1 MGD from a reservoir owned by your PWS and 1 MGD of surface water you purchase from an adjacent PWS:

| Ground Water | Surface Water | Purchased Ground | Purchased Surface |
|---|---|---|---|
| 50% | 25% | % | 25% |

**Table D6 Metered Finished Water Consumption by Service Type**

Summarize all the private and municipal metered water use from your system in Table D6. Do not include unmetered municipal uses such as street cleaning and hydrant flushing. Unmetered municipal uses are accounted for in Section G, Table G10.

The following are descriptions of the various categories of service types. Under the Safe Drinking Water Act, the U.S. EPA requires MassDEP to collect and report water use data in these categories.

**Residential:**

The U.S. EPA, under the Safe Drinking Water Act, requires that the residential categories identified in Table D6 be reported by all PWSs. Some categories may be more applicable to other parts of the country with different demographics and development practices. For most Massachusetts communities, MassDEP expects the majority of residential service types to be accounted for under Residential Area. A PWS may use some flexibility in assigning service connections to the appropriate category. However, it is important to accurately report the totals for each group of service types (Residential, Residential Institutional, Non-residential Institutions, Commercial, Agricultural, Industrial, Recreational, and Other).

Residential Institutions are in a separate residential category in Table D6. This was done so that communities with colleges, prisons etc. can exclude the water used by these institutions from their Residential Gallons per Capita Day (RGPCD) calculations in Section G. For the purposes of calculating RGPCD, a community may want to exclude residential institutions because of the difficulty in determining seasonally fluctuating residential population of these institutions. However, if a community wants to include some or all of its residential institutional water use and the associated population as part of its RGPCD calculation it may. If some or all of the Residential Institutions water use is excluded from the RGPCD calculation, the population using the water must also be excluded.

All residential uses are to be reported in Table D6, even if a service is billed at a commercial rate and the entity served is a for-profit customer. For example, even if a for-profit apartment building is billed at a commercial rate, the water use must be counted as residential on Table D6.

Residential Area: These are service connections to single-family homes, multi-family homes and apartment buildings. Most residential service connections in Massachusetts are going to fall in this category, and many PWSs will report all their residential water use in this category.

Subdivision: This service type is when one service connection serves an entire subdivision consisting of multiple detached homes.

Homeowners Association: This is when one service connection and meter serves an entire condominium association building. If each condo within a complex has its own meter, then include them in the Residential Area category. This category also includes one service connection to a group of detached, single or multi-family homes that are part of a homeowners association with common property, maintenance fees, etc.

Mobile Home Park (principal residence): This category is for mobile home parks used as principal, year-round residences by the occupants. Single mobile homes that are not part of a mobile home park should be included in the Residential Area category.

Secondary Residences: These service connections are generally to residences that are used seasonally, on weekends, or otherwise not used by their occupants as their primary residence. These service connections would be expected to be used cumulatively less than six months during the year. This would include lake or beach camps, hunting camps, ski condos, etc.

Mobile Home Park (non-primary residence): These service connections are generally to mobile homes in mobile home parks that are used seasonally, on weekends, or otherwise not used by their occupants as their primary residence. These service connections would be expected to be used cumulatively less than six months during the year.

Other Residential Area: Include other residential service connections that do not fit into the above categories. If you use this category, provide a description of the facility.

**Residential Institutions**

Institutions (prisons, mental facilities, nursing & rest homes, universities, colleges, dormitories): Includes service connections to facilities that house large numbers of people for extended periods of time in a group setting without separate household quarters. This includes boarding schools and colleges and universities with dormitories. Refer to Residential guidance above on including Residential Institutions water use and population in your RGPCD calculation in Section G.

## Non-Residential Institutions

Non-residential service types are for non-commercial (non-retail) facilities that provide water for human consumption for people whose primary residence is elsewhere. People in these facilities use them either only during the day (e.g. schools and day care centers) or for short overnight stays (e.g. summer camps, hospitals).

Medical Facility: This includes hospitals, rehabilitation centers, clinics, and doctors' offices.

Schools (includes K-12): This includes all public and private schools that do not have residence halls. It would include higher education institutions such as community colleges that do not have dormitories. It does not include boarding schools, which would go in the "Residential Institutions" category under Residential service types.

Day Care Center: This includes facilities for the care of children that are not educational facilities. These facilities are generally for taking care of young children during business hours while parents are working.

Summer Camp: Children stay at these facilities, either during daylight hours or overnight, for one or more weeks during the summer only.

**Commercial**

This category is not to include apartment buildings, condo associations, etc., even if those services are billed at a commercial rate. Water provided to residential buildings are accounted for under the appropriate residential service type, whether or not the entity is billed at a commercial rate.

**Transient Commercial**

Service Station: These facilities sell retail gasoline and may or may not also provide mechanic services. This category includes convenience stores that sell retail gasoline and auto repair shops that do not sell gasoline.

Restaurant: This includes fast-food restaurants, take-out only restaurants, seasonal restaurants such as ice-cream stands, diners, coffee shops, and sit-down restaurants with table service.

Highway Rest Area: Includes service areas on limited access highways with restroom facilities. Restaurants operating at the rest area would be included in the restaurant category if metered separately.

Hotel/Motel: Provide overnight rooms at a daily rate, including bed & breakfast facilities.

Other Transient Area: This category includes office buildings and other workplaces that do not provide retail services to customers. It also includes public and private campgrounds and RV parks.

**Non-Transient Commercial**

Retail: This category includes stores and other retail outlets that sell products and services to customers. This includes food and non-food stores, beauty shops, post offices, movie theaters, etc.

Dispenser: These facilities sell water retail to individual customers. This includes retail water-dispensing kiosks where customers fill water bottles.

Interstate Carrier: These are bulk carriers that truck water across state lines for use as public drinking water.

Water Bottler: These are facilities that bottle water for distribution to retailers. This includes water bottled for sale in stores, generally in one gallon or smaller containers, and water bottled for water coolers, generally in five-gallon containers.

Wholesaler: This includes entities that sell water in large quantities, for example trucking companies that sell tanker trucks of water to fill swimming pools, for construction sites, etc. This may also include hydro-seeding companies that fill their trucks from hydrants, if this use is metered.

Other Non-Transient Area: This includes other water service types that do not fit into the above categories. Provide a description of the service type.

**Agricultural:** This includes water for growing fruits and vegetables for human consumption, water for raising animal feed such as corn, water used for animal husbandry, and water used for wholesale or retail nurseries.

**Industrial:** This includes services that provide water primarily for industrial processes or manufacturing, including factories and electric power plants.

**Recreational**: These are commercial entities in which most of the water is used for other than human consumption such as golf courses, ski areas and water parks.

**Other:**

Municipality: These are metered services providing water to a municipal building, park, playing field or other use. This category does not include public K-12 schools. Schools are included in schools (K-12) under Non-Residential Institutional. Non-metered municipal uses such as hydrant flushing and street cleaning are not included here, but are included in Table G10 of Section G.
Sanitary Improvement Area: Refers to districts in the central U.S. Not applicable to Massachusetts.
Other Area: Include any metered uses not included in the above categories.

**Instructions for Completing the 2007 Public Water Supply Annual Statistical Report for Community (COM) systems using 100,000 gallons per day or more.**

**System Total:** The total of the "# of service connections" column is the total number of individually metered service connections in the PWS distribution system. The total Metered Amount (MGY) is the total amount of metered water distributed in the year, in million gallons (enter this value in Table G11 - Unaccounted for Water). The % of Total metered use should add up to 100%. Below is an example Table D6 for your reference.

**Example Table D6: Metered Finished Water Consumption by Service Type**

| | Service Type | | # of service connections | Metered Amount (MGY) | % of Total Metered Use |
|---|---|---|---|---|---|
| Residential | Residential Area | | 350 | 60 | 50% |
| | Subdivision | | | | |
| | Homeowners Association (condos) | | 50 | 3 | 2.5% |
| | Mobile Home Park (principal residence) | | 50 | 2 | 1.7% |
| | Secondary Residences | | | | |
| | Mobile Home Park (non-primary residence) | | | | |
| | Other Residential Area | | | | |
| | **Residential Total:** | | **450** | **65** | ---------- |
| Residential Institutions | **Residential Institutions (prisons, mental facilities, nursing & rest homes, universities, colleges, dormitories):** | | **5** | **4** | 3.3% |
| Non-Residential Institutions | Medical Facility | | 5 | 2 | 1.7% |
| | Schools (includes K-12) | | 10 | 1 | 0.8% |
| | Day Care Center | | | | |
| | Summer Camp | | | | |
| | **Non-Residential Institutions Total:** | | **15** | **3** | ---------- |
| Commercial<br><br>Note: Some towns have included types of multi-family housing in the commercial category - these must be included in the appropriate residential category. | Trans-ient Com-mercial | Service Station | | | |
| | | Restaurant | 2 | 2 | 1.7% |
| | | Highway Rest Area | | | |
| | | Hotel/Motel | 1 | 2 | 1.7% |
| | | Other Transient Area | | | |
| | Non-Trans-ient Com-mercial | Retail | 5 | 1 | 0.8% |
| | | Dispenser | | | |
| | | Interstate Carrier | | | |
| | | Water Bottler | | | |
| | | Wholesaler | | | |
| | | Other Non-Transient Area | | | |
| | **Commercial Total:** | | **8** | **5** | ---------- |
| Agricultural | **Includes horticultural nursery, cranberry growers, farms & other agriculture:** | | **5** | **10** | 8.3% |
| Industrial | **Includes Industry and manufacturing:** | | **1** | **5** | 4.2% |
| Recreational | **Includes ski areas, golf courses & other recreational areas:** | | **1** | **3** | 2.5% |
| Other | Municipality (metered municipal use) | | 10 | 15 | 12.5% |
| | Sanitary Improvement District | | | | |
| | Other Area | | 5 | 10 | 8.3% |
| | **Other Total:** | | **15** | **25** | ---------- |
| System Total | **SYSTEM TOTAL METERED USE:** | | **500** | **120** (enter in Table G11) | **100.0** |

**This table is only for reporting metered, recorded water uses. This table is not for reporting non-metered confidently estimated municipal use such as fire fighting or hydrant flushing. Confidently estimated non-metered municipal uses are reported in Table G10.**
To obtain "% of Total Metered Use" (last column), divide the metered amount for each sub-category by the total metered amount (bottom line of middle column). Examples: for residential area, divide 60 by 120 (60/120 = 0.50 x 100 = 50 %); for medical facility divide 2 by 120 (2/120 = 0.01666 x 100 = 1.7%).

## Section E Individual Source Statistics

This section summarizes the monthly pumping of raw water from each source that the PWS operates. This is raw, untreated water pumped from a well or surface water intake. Regulations require sources of water to be metered. The volumes reported in Section E are the volumes measured with the source meters.

## Table E1 Individual Raw Water Source Statistics

Source Name, PWS Source ID # and Source Watershed: These data are included on the PWS Water Management Registration and/or Permit. Source Name is the common name such as Main Street Well No. 1 for a groundwater well or Adams Pond for a surface water intake. PWS Source ID # is the MassDEP-issued number for each source such as 1029000-03G where 1029000 is the PWS ID and -03G designates that it is the third groundwater source of that PWS. Source watershed is one of the 27 major Massachusetts watersheds within which the source is located such as Neponset, Charles or Connecticut. These are listed on the registration and/or permit. The source watershed is not the name of the local sub-basin such as Beaver Brook or Mill River.

Source Availability:

Active Source (Formerly: Permanent, Backup, Seasonal, Provisional, Interim): an approved source, monitored and maintained to meet 310 CMR 22.00 and used for primary or backup purposes to meet consumer demand as necessary.

Inactive Source (Other, contaminated): an approved source, which is expected to be off-line for at least one year (12 months). A source may be deemed inactive only upon written approval of the Department. An inactive source may not return to active status without written approval from the Department.

Emergency Source: any source of water used to supplement or temporarily replace a public water system's active or inactive source when water of sufficient quality or quantity is not available. An emergency source may be placed on-line only after the Department's approval pursuant to a declaration of a state of water emergency under M.G.L. c. 1G § 15-17 or as a requirement of a Department administrative order.

Abandoned Source (Formerly: Other): a source that is physically disconnected from a public water system and is no longer maintained as an active, inactive, or emergency source. An abandoned source cannot be used as a public water supply source. A source may only be abandoned pursuant to 310 CMR 22.25.

Date of Meter Installation: Provide the date that the presently used source meter was installed.

Date Last Meter Calibration for this Source: Provide the most recent date that the meter for this source was calibrated.

Withdrawal Units (check one): Check whether you are reporting your withdrawal volume in gallons (GAL) or million gallons (MG).

Example: For March 2007 Well # 1 pumped 4,350,800 gallons.
If reported as GAL: 4,350,800
If reported as MG: 4.3508

Total Amount Pumped: For each source, tally the monthly volumes to obtain the total amount of water pumped in the year.

Total # of Days Pumped: Provide the total number of days in the year that this source was pumped for water supply.

Max. Single Day Pumped Volume: For each source, provide the highest one-day volume that was pumped during the year.

Date Max. Amount Pumped: Provide the date on which the above maximum one-day pumping occurred. If the maximum one-day pumping happened on multiple days, then provide the first date on which this occurred.

## Section F Watershed/Ground Water Inspection Report

Complete one section F for each protection area in your system. If you have two Zone IIs for your groundwater sources and one Watershed for a surface water source, then complete three separate copies of Section F.

1. Identify the protection area: Zone II, IWPA (Interim Wellhead Protection Area) for groundwater sources or Watershed (Zones A, B or C) for surface water sources. Watershed in Section F refers to the drainage area of the surface water source from which you withdraw water, not the major river basin in which the source is located.

   Enter the information for each source in the protection area inspected. If there are more than five sources in a protection area, attached additional sheets documenting source name and ID for all sources in the protection area. For each source enter the SOURCE ID: (e.g. 1234000-01G) and Source Name: (e.g. West Street Well).

2. Identify the current municipal protection for the Zone II / IWPA. Check with the Town/City Clerk for zoning bylaws/ordinances and general bylaws/ordinances, and with the Board of Health for their bylaws.

3. Identify and describe and land use activities that pose a threat to drinking water quality.

4. Document if you identified violations of land use controls during your inspection. Describe any violations you identified, for example new or expanded hazardous waste generation, industrial wastewater discharges, underground storage tanks, etc. In addition to state regulated land uses (such as landfills, wastewater treatment plants, etc.) public water suppliers need to be familiar with the land uses and activities prohibited by the municipality. Your PWS should have a copy of their municipal zoning bylaws/ordinances, general bylaws/ordinances and health regulations on file.

5. Identify any wells by Source ID and name for which you do not own the entire Zone I.

## Section G Water Management Act Annual Report

You may or may not need to complete all of Section G, depending on if your PWS holds a WMA permit and/or registration, or if you purchase all of your water (e.g. PWSs fully served by MWRA), or if you only sell water to one or more PWSs (e.g. MWRA). The following matrix indicates which tables in Section G you must complete.

| Section G Table (• indicates that you must complete the table) | Do not hold WMA Permit or Registration (purchase all water, e.g. community fully served by MWRA) | Hold WMA Permit and/or Registration, but only sell water (do not own PWS distribution system, e.g. MWRA) | Hold WMA Permit and/or Registration AND own PWS distribution System |
|---|---|---|---|
| G1 Permit & Registration Information | | • | • |
| G2 Permit Special Conditions | | • | • |
| G3 Leak Detection Survey | • | | • |
| G4 Water Conservation | • | | • |
| G5 Average Daily Withdrawal by Watershed | | • | • |
| G6 WMA Authorized Withdrawal vs. 2007 Actual Withdrawal | | • | • |
| G7 RGPCD Method 1* | • | | • |
| G8 RGPCD Method 2 Step 1 AND G9 RGPCD Method 2 Step 2* | • | | • |
| G10 Confidently Estimated Municipal Uses | • | | • |
| G11 Unaccounted for Water | • | | • |
| G12 Sources of Unaccounted for Water | • | | • |

* Choose RGPCD Method 1 (Table G7) or Method 2 (Tables G8 and G9)

If you have any questions concerning Section G, please contact Richard Friend with the WMA program at (617) 654-6522 or email him at richard.friend@state.ma.us .

### 1. General Information

**Table G1 Permit and Registration Information**
Complete this section if your PWS has a registration or permit for withdrawal of water. For each watershed, include the permit number and/or registration number for the water withdrawal. This information is included on the permits and registrations. Some suppliers have registrations only, some have permits only, and some have both permits and registrations. The watersheds are the 27 major Massachusetts watersheds and are on the registrations and permits. They are *not* local sub-basins.

**Table G2 Permit Special Conditions**
This is to be completed only by suppliers with Water Withdrawal Permits that contain special conditions such as monitoring groundwater elevations, wetland impact assessment, pond elevations, etc. that require annual reporting to MassDEP. Review your WMA permit and list any Special Conditions in the permit that require an annual report be submitted to MassDEP. If a required report was submitted earlier in the year, please give the date of submission. Note if the required report is being submitted with this ASR.

**Table G3 Leak Detection Survey Summary**
Complete the table outlining annual leak detection work. Most suppliers with their own sources will complete the "Distribution System Water Mains" column only. Suppliers who receive their water from other systems or regional water suppliers may need to complete the "Source(s) of Supply Transmission Water Main" column as well.

**Table G4 Water Conservation – Summer Limits on Withdrawals**
If your PWS serves more than one community, copy this page as necessary to answer questions 1 through 3 for each community served.

1. Your WMA permit may contain special conditions that limit pumping. If so, check "yes" and specify what triggers pumping limitations (calendar, streamflow, or other).

2. Indicate if the community served by your PWS has a local bylaw or ordinance that restricts nonessential outdoor water use.

   a. Indicate if bylaw or regulations allow for voluntary restrictions, mandatory restrictions, or both.

   b. Indicate whether or not water use restrictions were implemented during the year. If restrictions were implemented, enter the date implemented.

   c. If restrictions were implemented, indicate if MassDEP was notified.

3. Describe the outdoor water use restrictions implemented by checking the appropriate boxes and/or specifying. For example a town may restrict pumping to 2 days per week, and only between the hours of 5PM and 9AM. Therefore two boxes would be checked, ☒ 2 days/week and ☒ 5 PM to 9 AM restriction.

**2. Water Withdrawal by Watershed**

**Table G5 Average Daily Withdrawal by Watershed**

For each watershed from which the PWS pumped water, enter the total actual withdrawal of raw water (from Table E1). The watersheds are the 27 major Massachusetts watersheds not local sub-basins. The watersheds are in the permits and registrations.

**Example 1:** A PWS has a registration to withdraw 0.54 MGD from three wells from Beaver Brook, a sub-basin of the Connecticut River basin and a WMA permit to withdraw an additional 0.2 MGD, also from a well in the Connecticut River basin. In 2007 the PWS pumped a total of 237.25 million gallons (MG) from all of four of its wells:

**Table G5 Example 1:**

| Massachusetts Watershed | Total Actual Raw Withdrawal Volume (MGY) (from Table E1) | / 365 = | Watershed Average Daily Withdrawal (MGD) |
|---|---|---|---|
| 1. Connecticut | **237.25** | / 365 = | **0.65** |
| 2. | | / 365 = | |
| 3. | | / 365 = | |

**Example 2:** A PWS has four wells along the Mill River in the Charles River Basin, three under a registration and one under a WMA permit. The PWS also has a WMA permit to withdraw water from a reservoir in the Concord River basin. In 2007 the PWS pumped a total of 547.5 million gallons (MG) from the four Charles River wells and a total of 328.5 MG of water from its reservoir in the Concord River basin:

**Table G5 Example 2:**

| Massachusetts Watershed | Total Actual Raw Withdrawal Volume (MGY) (from Table E1) | / 365 = | Watershed Average Daily Withdrawal (MGD) |
|---|---|---|---|
| 1. Charles | **547.5** | / 365 = | **1.5** |
| 2. Concord | **328.5** | / 365 = | **0.9** |
| 3. | | / 365 = | |

**Table G6 – WMA Authorized Withdrawal vs. 2007 Actual Withdrawal**

Table G6 compares the total maximum withdrawal volumes specified in your registration(s) and/or permit(s) to the actual volumes pumped from each watershed.

Massachusetts Watershed: Name each watershed for which your PWS has been issued a permit and/or registration. The watershed names are specified in the permits and registrations and are the 27 major Massachusetts watersheds, not the local sub-basin or stream of the withdrawal point.

Registered Volume (MGD): Enter the authorized annual daily average withdrawal, in million gallons per day (mgd), specified in the registration issued by MassDEP.

Permitted Volume (MGD): Enter the authorized annual daily average withdrawal, in million gallons per day (mgd), specified in the WMA Water Withdrawal permit issued by MassDEP.

WMA Authorized Withdrawal Volume (MGD): Add the registered and permitted volume, in million gallons per day (mgd), for each watershed.

Daily Avg. Raw Water Use (MGD): Enter the actual volume of water pumped during the year from all sources in the watershed in million gallons per day (MGD). Get these values from Table G5.

Difference: For each watershed, subtract actual water pumped from the WMA authorized volume. If less water was pumped than is authorized, the last column will be a positive value. If more water is pumped than is authorized, the last column will be a negative value. If the value is negative and exceeds the total authorized volume by more than 0.1 mgd, you may need to obtain a permit or permit amendment. Contact Richard Friend, WMA staff at (617) 654-6522.

**Instructions for Completing the 2007 Public Water Supply Annual Statistical Report for Community (COM) systems using 100,000 gallons per day or more.**

**Example 1:** A PWS has a registration to withdraw 0.54 MGD from three wells from Beaver Brook, a sub-basin of the Connecticut River basin and a permit to withdraw an additional 0.2 MGD, also from a well in the Connecticut River basin. In 2007 the PWS pumped a total of 237.25 million gallons (MG) from all of four of its wells. The daily average withdrawal from Table G5 (Example 1 above) is 0.65 MGD.

**Table G6 Example 1:**

| Massachusetts Watershed | Registered Volume (MGD) | + | Permitted Volume (MGD) | = | WMA Auth. Withdrawal Volume (MGD) | - | Daily Avg. Raw Water Use (MGD) (from Table G5 above) | = | Difference* |
|---|---|---|---|---|---|---|---|---|---|
| 1. Connecticut | 0.54 | + | 0.2 | = | 0.74 | - | 0.65 | = | 0.09 |
| 2. | | + | | = | | - | | = | |
| 3. | | + | | = | | - | | = | |

***** A positive (+) value indicates that withdrawals are within the WMA authorized volume. A negative (-) value indicates that withdrawals exceed the WMA authorized volume. If a PWS exceeds its WMA authorized volume by 0.1 MGD or more, a permit or permit amendment may be required. Contact Richard Friend, WMA staff, at (617) 654-6522.

The difference is a positive value, and therefore the water supplier pumped 0.09 mgd less than the authorized withdrawal volume.

**Example 2:** A PWS has four wells along the Mill River in the Charles River Basin, three under a registration and one under a WMA permit. The PWS also has a WMA permit to withdraw water from a reservoir in the Concord River basin. In 2007 the PWS pumped a total of 547.5 million gallons (MG) from the four Charles River wells (1.5 MGD) and a total of 328.5 MG of water from its reservoir in the Concord River basin (0.9 MGD):

**Table G6 Example 2:**

| Watershed | Registered Volume (MGD) | + | Permitted Volume (MGD) | = | WMA Auth. Withdrawal Volume (MGD) | - | Daily Avg. Raw Water Use (MGD) (from Table G5 above) | = | Difference* |
|---|---|---|---|---|---|---|---|---|---|
| 1. Charles | 1.2 | + | 0.4 | = | 1.6 | - | 1.5 | = | 0.1 |
| 2. Concord | | + | 0.6 | = | 0.6 | - | 0.9 | = | - 0.3 |
| 3. | | + | | = | | - | | = | |

***** A positive (+) value indicates that withdrawals are within the WMA authorized volume. A negative (-) value indicates that withdrawals exceed the WMA authorized volume. If a PWS exceeds its WMA authorized volume by 0.1 MGD or more, a permit or permit amendment may be required. Contact Richard Friend, WMA staff, at (617) 654-6522

The difference in the Concord basin is a negative value, and therefore the water supplier pumped 0.3 MGD above the authorized withdrawal volume and therefore is not in compliance. The supplier must contact MassDEP to determine what steps to take.

### 3. Residential Gallon per Capita Day (RGPCD)

Residential Gallons per Capita Day (RGPCD) is how much water an average resident uses on an average day in the year. Two values are used to calculate RGPCD: the population served by a PWS and the total amount of residential metered use (from Table D6). Calculate RGPCD by dividing the total annual residential volume (in millions of gallons per year) by 365 (days in the year), multiplying by 1,000,000, and dividing that number by the population served by the PWS.

$$\frac{\text{Total residential metered use (MG)}}{365 \text{ days} \times \text{population served}} \times 1{,}000{,}000 = \text{RGPCD (gal/day/person)}$$

In almost all cases, the total residential metered use is the Residential Total water use volume from Table D6. This is the volume of water provided through metered service connections to residential buildings. It is the total water sold, in millions of gallons (MG) in a calendar year. You may also wish to include part or all of your Residential Institutions in the RGPCD calculation. If you include Residential Institutional use, you must include the water volume and the population using that volume. If you exclude some or all of your Residential Institutional water use, you must also exclude the population using the water from your RGPCD calculation.

There are multiple methods for determining RGPCD, depending on how population is determined. The population served by the PWS is often the value that is more difficult to accurately obtain, especially for partially served communities and communities with high seasonal fluctuations in population. Use Method 1 when the population served by the PWS can be accurately determined from U.S. census data, local census data, or other data. Fully served communities (those community systems that serve all or nearly all of the population of a city or town) will always use Method 1A. Partially served communities will use Method 1B when the population served can be accurately determined. Communities with high seasonal fluctuations use Method 1C.

Method 2 is used when the population served by the PWS cannot be accurately determined from census data and must be estimated based on published values of average community household size and the number of residential service connections. The number of households is estimated from the number of service connections, and the population is then estimated from the number of households.

Definitions:

**Fully served community**: A city or town in Massachusetts in which 100% of the residential population obtains their drinking water from the PWS. If some homes within the town boundaries are served by private wells or another PWS, then it is not a fully served community.

**Partially served community**: A city or town in Massachusetts in which only a portion of the residential population living within the town boundary obtain drinking water from the PWS.

### Table G7 RGPCD Method 1 Residential Population Served is Accurately Known

Use Table G7 to compute RGPCD for fully served communities or for partially served communities if the population served can be accurately determined from census data, a survey, or other sources such as a town GIS database, town clerk records assessor's office records or other local data source. Also use Table G7 if the community served by your PWS has a high seasonal fluctuation and you are pro-rating the population served to account for the seasonal influx.

For fully served communities, use the most recent census data (federal 2000 census or more recent local population data). The residential population served is the total residential population of the community.

Some partially served communities can accurately determine the population served by a PWS from local data sources, for example the town clerk may have records of the number of residents at each dwelling, the PWS may have data on its residential customers, or the population of the community not served by the PWS (use private wells or are served by another PWS) can be accurately determined and can be subtracted from the entire population of the community to obtain the population served by the PWS.

Some communities have significant seasonal fluctuations in their residential population, especially Cape Cod and the Islands. MassDEP understands that accurately determining population in these communities is problematic, however, it must be estimated as accurately as possible. If the summer population is known or estimated, pro-rate the summer population for the duration of time they are residing in the community.

**Seasonal Population Fluctuation Example:** An influx of 20,000 people live in town for June, July and August (25% of the year). Multiply 20,000 x 0.25 = 5,000 people served by the PWS. Add this to the year-round population of 8500 people from census data to get a total pro-rated population served by the PWS of 13500.

Example Population Calculation:
Step 1: Pro-rate summer population:

| **Summer Population Influx** | **x** | **% of the year that influx lives in community** | **=** | **Pro-rated summer population** |
|---|---|---|---|---|
| 20,000 | x | 0.25 | = | 5,000 |

Step 2: Add pro-rated summer population to year-round population:

| **Pro-rated summer Population** | **+** | **Year-round population** | **=** | **Pro-rated year-round population** |
|---|---|---|---|---|
| 5,000 | + | 8500 | = | 13,500 |

Step 3: Use the pro-rated year-round population and total annual residential metered use to calculate RGPCD

**RGPCD Method 2 for Partiality Served Communities where Population Served must be Estimated**
Use RGPCD Method 2 for partially served communities where the population served cannot be determined and must be estimated from the number of households. Number of households is determined from the number of service connections. To obtain an estimate of the population served, average community household size from federal census data is multiplied by the number of households served by the PWS.

**Table G8 RGPCD Method 2 Step 1 – Estimated Number of Households Served by the PWS**

The first step in estimating population is to determine the number of households from the number of residential service connections. Sort service connections according to the number of households they serve. Each service connection has a separate water meter. If every service connection is to a single-family home, then the number of service connections and households will be equal. Multi-family homes on one service connection will result in more households than service connections. Refer to the examples below.

**Instructions for Completing the 2007 Public Water Supply Annual Statistical Report for Community (COM) systems using 100,000 gallons per day or more.**

**RGPCD Method 2 Example 1**: A PWS serves only the downtown portion of a community and the residential population served cannot be accurately determined from federal or local data sources. However, all of the residential service connections are to single-family homes. There are 1,500 residential service connections and the federal census Website (http://www.mass.gov/dhcd/Temp/03/HsMgData/default.htm) lists the community household size as 3.85 persons per household. For the ASR reporting year, the PWS metered residential use was 137 million gallons (from Table D6 of the ASR).

**Table G8 Example 1**

| Type of Residential Service Connection (single-family, two-family, etc.) | Total # of service connections to each Type | | # of households per service connection (1 for single family, 2 for two-family, etc.) | | # of households |
|---|---|---|---|---|---|
| Single- Family: | 1500 | x | 1 | = | 1500 |
| Two-Family: | | x | 2 | = | |
| Three Family: | | x | 3 | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | | **Total number of households served:** | | 1500 |

In this example, the number of households equals the number of service connections because every connection is to a single-family dwelling.

The next step is to multiply the number of households by the average household size to determine the population served.

**Table G9 Example1**

First calculate population served:

| Total # of Households (from Table G8) | x | Average Household Size from DHCD website | = | Population Served |
|---|---|---|---|---|
| 1500 | x | 3.85 | = | 5775 |

Finally use the Population Served value to calculate RGPCD:

| Total Residential Use (MGY) (from Table D6)* | /365 | / Population Served (from above) | X 1,000,000 = | RGPCD |
|---|---|---|---|---|
| 137 | /365 | / 5775 | X 1,000,000 = | 65 |

(gallons/person/day)

*Refer to ASR Instructions for guidance on whether and how to include Residential Institutional water use and population in your RGPCD calculation

**RGPCD Method 2 Example 2**: A PWS serves only a portion of a community and the residential population served cannot be accurately determined from federal or local data sources. Most service connections are to single-family homes, but there are several multi-family dwellings served by the PWS. These are sorted into 2-family homes, 3-family homes, three apartment buildings and one condo association on one meter. The federal census Website (http://www.mass.gov/dhcd/Temp/03/HsMgData/default.htm) lists the community household size as 2.8 persons per household. For the ASR reporting year, the PWS metered residential use was 264.6 million gallons (from Table D6 of the ASR).

**Table G8 Example 2**

| Type of Residential Service Connection (single-family, two-family, etc.) | Total # of service connections to each Type | | # of households per service connection (1 for single family, 2 for two-family, etc.) | | # of households |
|---|---|---|---|---|---|
| Single- Family: | 4000 | x | 1 | = | 4000 |
| Two-Family: | 50 | x | 2 | = | 100 |
| Three Family: | 10 | x | 3 | = | 30 |
| 50 unit apartment bldgs. | 2 | x | 50 | = | 100 |
| 75 unit apartment bldg | 1 | x | 75 | = | 75 |
| 10 unit condo assn | 1 | x | 10 | = | 10 |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | x | | = | |
| | | | **Total number of households served:** | | 4315 |

In this example, there are 4, 064 service connections serving 4,315 households. The next step is to multiply 4,315 households by the average household size.

**Table G9 Example2**

First calculate population served:

| Total # of Households (from Table G8) | x | Average Household Size from DHCD website | = | Population Served |
|---|---|---|---|---|
| 4315 | x | 2.8 | = | 12,082 |

Finally use the Population Served value to calculate RGPCD:

| Total Residential Use (MGY) (from Table D6)* | /365 | / Population Served (from above) | X 1,000,000 = | RGPCD |
|---|---|---|---|---|
| 264.6 | /365 | / 12,082 | X 1,000,000 = | 60 |

*Refer to ASR Instructions for guidance on whether and how to include Residential Institutional water use and population in your RGPCD calculation

(gallons/person/day)

**4. Unaccounted for Water**

**Table G10 Total Confidently Estimated Municipal Use**

Table G10 is for reporting unmetered uses of water for municipal purposes. Losses of water due to ongoing leaks discovered during leak detection surveys are not included in this table. Water lost to major water main breaks is included, but a description of the break must be provided (location, date, volume of water lost). For all of the water included in the table, provide calculations and documentation of how the volumes were calculated. **Water volumes listed in Table G10 will be counted toward unaccounted for water (UAW) unless documentation is provided.**

Fire Protection and Training: This volume can be taken from data provided by the local Fire Department (Chief or Deputy's office) in writing or the volumes can be obtained from meters on booster pumps.

Hydrant /water main flushing: Volumes used during annual or biannual flushing of the distribution network can be calculated by using the number of hydrants times average volume flowed times number of times flushed. All hydrant and system flow test volume estimates must be presented in table form to be eligible for municipal use.

Flow testing: Flow testing volumes can be calculated using completed Insurance Services Organization (ISO) flow sheets that provide hydrant locations, street addresses and flow rates. Multiply the flow rate for each test times the flushing time, rounded to 5-minute increments. All system flow test volume estimates should be presented in tabular form. Volumes of water used to fill new or replaced water mains may be calculated and reported in a tabular form, complete with street, project number or other identifying information.

Bleeders / Blow offs: All bleeders should be metered whenever possible. Meter readings should be taken regularly to determine the volumes of water that are run to waste. For bleeders that cannot be metered, volumes can be calculated by using a low volume pilot gauge to determine the gallons per minute that run to waste and extrapolating an annual volume. Documentation must be provided.

Tank overflow & drainage: When a storage tank is overflowed for water quality purposes, the overflow volume can be calculated using daily storage tank readings or flow out of the overflow piping can be calculated using 50% of the flow rate from pumps that are on in the system at the time of the overflow. The duration of the overflow is determined through observation and by when pumps are shut off or when instrumentation controls are adjusted to automatically shut off pumping systems.

Major water main breaks: **Leaking water found during leak detection surveys or discovered otherwise is not considered a municipal use and is not included in Table G10.** However, very large individual water main breaks can be discounted on a case-by-case basis. Document the date discovered, date repaired, duration of the break, cause (if known) and estimated water loss. MassDEP will review these submittals to determine eligibility.

Street cleaning: Water volume used by street cleaning sweepers can be calculated by multiplying the volume of the street sweeper tank(s) times the number of times filled. Logs should be kept on file.

Sewer and stormwater system flushing: Water volume used for stormwater flushing or in sewer main type work can be confidently estimated through a metered volume using a hydrant meter/construction-type meter.

Other: Other volumes that a PWS wants to include as confidently estimated municipal water uses must be described and calculations provided. MassDEP will review these submittals and determine eligibility.

### Table G11 Unaccounted for Water

Enter the total amount of finished water in millions of gallons (MG) that entered the distribution system after treatment. This is from Table D1, Total Net Finished Water. Then enter the total metered use volume, which is the bottom line of Table D6. From Table G10 enter the Total Confidently Estimated Municipal Use. From the Total Finished Water subtract the Total Metered Use and the Total Confidently Estimated Municipal Use. The remaining volume (bottom line) is the unaccounted for water.

### Table G11 Example

A PWS pumped 500 million gallons of finished water into its distribution system. Of that 500 MGY, 470 was metered. This was 94% of the total water available for distribution (470/500 = 94%). An additional 5 MGY was unmetered but documented water used for municipal purposes (5/500 = 1%). This resulted in 25 MGY being unaccounted for. This was 5 % of the entire water pumped into the distribution system (25/500 = 5%).

**Example**

**Table G11 Unaccounted for Water**

| | Million Gallons/Year (MGY) | | % of Total Water Available for Distribution |
|---|---|---|---|
| Total Finished Water Available for Distribution **(Total Net Finished Water (MGY) from Table D1)** | 500 | | 100% |
| Total Metered Use **(System Total Metered Use (MGY) from Table D6)** | - 470 | - | 94 % |
| Total Confidently Estimated Municipal Use **(Total from Table G10 above)** | - 5 | - | 1 % |
| **Unaccounted for Water (UAW)** | = 25 | = | 5 % |

### Table G12 Sources of Unaccounted for Water

Table G12 is for documenting where you know or believe water loss is occurring. These sources can be either real water loss (leaks, etc.) or accounting losses (meter problems, etc.). Enter water loss detected during leak detection surveys in the first row. Some suppliers have reported that water theft from hydrants is occurring in their community. Enter any water theft you can document or estimate in the second row. Water use not registered at service connections is entered in the third row. The last three rows are for any other sources of unaccounted for water. Attach calculations or explanations of the source(s) of unaccounted for water to the ASR.